

## Preliminary Classification:

Proposed Class:

Subclass:

NOTE: "All applicants are requested to include a preliminary classification on newly filed patent applications. The preliminary classification, preferably class and subclass designations, should be identified in the upper right-hand corner of the letter of transmittal accompanying the application papers, for example 'Proposed Class 2, subclass 129.'" M.P.E.P. § 601, 7th ed.

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

## NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): Jarkko SEVANTO, Mikko PUUSKARI

WARNING: 37 C.F.R. § 1.41(a)(1) points out:

"(a) A patent is applied for in the name or names of the actual inventor or inventors.

"(1) The inventorship of a nonprovisional application is that inventorship set forth in the oath or declaration as prescribed by § 1.63, except as provided for in § 1.53(d)(4) and § 1.63(d). If an oath or declaration as prescribed by § 1.63 is not filed during the pendency of a nonprovisional application, the inventorship is that inventorship set forth in the application papers filed pursuant to § 1.53(b), unless a petition under this paragraph accompanied by the fee set forth in § 1.17(f) is filed supplying or changing the name or names of the inventor or inventors."

For (title): METHOD AND ARRANGEMENT FOR PREPARING FOR THE TRANSMISSION OF MULTIMEDIA-RELATED INFORMATION IN A PACKET-SWITCHED CELLULAR RADIO NETWORK

## CERTIFICATION UNDER 37 C.F.R. § 1.10\*

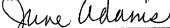
(Express Mail label number is mandatory.)

(Express Mail certification is optional.)

I hereby certify that this New Application Transmittal and the documents referred to as attached therein are being deposited with the United States Postal Service on this date March 22, 2000 in an envelope as "Express Mail Post Office to Addressee," mailing Label Number EL336863505US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

June Adams

(Type or print name of person mailing paper)



Signature of person mailing paper

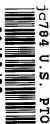
WARNING: Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. § 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

\*WARNING: Each paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. § 1.10(b).

"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will not be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

(New Application Transmittal [4-1]-page 1 of 11)

03/22/00



Jc784 U.S. PTO



Jc564 U.S. PTO

09/532551

03/22/00

**1. Type of Application**

This new application is for a(n)

(check one applicable item below)

- ☒ Original (nonprovisional)  
☐ Design  
☐ Plant

**WARNING:** Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. § 371(c)(4), unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

**WARNING:** Do not use this transmittal for the filing of a provisional application.

**NOTE:** If one of the following 3 items apply, then complete and attach **ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED** and a **NOTIFICATION IN PARENT APPLICATION OF THE FILING OF THIS CONTINUATION APPLICATION**.

- ☐ Divisional.  
☐ Continuation.  
☐ Continuation-in-part (C-I-P).

**2. Benefit of Prior U.S. Application(s) (35 U.S.C. §§ 119(e), 120, or 121)**

**NOTE:** A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or copending international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or copending international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. § 112. Each prior application must also be:

- (i) An international application entitled to a filing date in accordance with PCT Article 11 and designating the United States of America; or  
(ii) Complete as set forth in § 1.51(b); or  
(iii) Entitled to a filing date as set forth in § 1.53(b) or § 1.53(c) and include the basic filing fee set forth in § 1.16; or  
(iv) Entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21(f) within the time period set forth in § 1.53(f).

37 C.F.R. § 1.78(a)(1).

**NOTE:** If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an international application which designated the U.S., or benefit of a prior provisional application is claimed, then check the following item and complete and attach **ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED**.

**WARNING:** If an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. §§ 120, 121 or 365(c), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. §§ 120, 121 or 365(c). (35 U.S.C. § 154(a)(2) does not take into account, for the determination of the patent term, any application on which priority is claimed under 35 U.S.C. §§ 119, 365(a) or 365(b).) For a c-i-p application, applicant should review whether any claim in the patent that will issue is supported by an earlier application and, if not, the applicant should consider cancelling the reference to the earlier filed application. The term of a patent is not based on a claim-by-claim approach. See Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,205.

(New Application Transmittal [4-1]—page 2 of 11)

**WARNING:** When the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application must be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. See 37 C.F.R. § 1.78(a)(3).

- ☐ The new application being transmitted claims the benefit of prior U.S. application(s). Enclosed are ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

### 3. Papers Enclosed

- A. Required for filing date under 37 C.F.R. § 1.53(b) (Regular) or 37 C.F.R. § 1.153 (Design) Application

13 Pages of specification  
4 Pages of claims  
4 Sheets of drawing

**WARNING:** DO NOT submit original drawings. A high quality copy of the drawings should be supplied when filing a patent application. The drawings that are submitted to the Office must be on strong, white, smooth, and non-shiny paper and meet the standards according to § 1.84. If corrections to the drawings are necessary, they should be made to the original drawing and a high-quality copy of the corrected original drawing then submitted to the Office. Only one copy is required or desired. For comments on proposed then-new 37 C.F.R. § 1.84, see Notice of March 9, 1988 (1990 O.G. 57-62).

**NOTE:** "Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawing a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page . . ." 37 C.F.R. § 1.84(c).

(complete the following, if applicable)

- ☐ The enclosed drawing(s) are photograph(s), and there is also attached a "PETITION TO ACCEPT PHOTOGRAPH(S) AS DRAWING(S)." 37 C.F.R. § 1.84(b).  
☐ formal  
☐ Informal

### B. Other Papers Enclosed

       Pages of declaration and power of attorney  
  1   Pages of abstract  
       Other

### 4. Additional papers enclosed

- ☐ Amendment to claims  
☐ Cancel in this applications claims \_\_\_\_\_ before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)  
☐ Add the claims shown on the attached amendment. (Claims added have been numbered consecutively following the highest numbered original claims.)  
☐ Preliminary Amendment  
☐ Information Disclosure Statement (37 C.F.R. § 1.98)  
☐ Form PTO-1449 (PTO/SB/08A and 08B)  
☐ Citations

- ☐ Declaration of Biological Deposit
- ☐ Submission of "Sequence Listing," computer readable copy and/or amendment pertaining thereto for biotechnology invention containing nucleotide and/or amino acid sequence.
- ☐ Authorization of Attorney(s) to Accept and Follow Instructions from Representative
- ☐ Special Comments
- ☐ Other

**5. Declaration or oath (Including power of attorney)**

**NOTE:** A newly executed declaration is not required in a continuation or divisional application provided that the prior nonprovisional application contained a declaration as required, the application being filed is by all or fewer than all the inventors named in the prior application, there is no new matter in the application being filed, and a copy of the executed declaration filed in the prior application (showing the signature or an indication thereon that it was signed) is submitted. The copy must be accompanied by a statement requesting deletion of the names of person(s) who are not inventors of the application being filed. If the declaration in the prior application was filed under § 1.47, then a copy of that declaration must be filed accompanied by a copy of the decision granting § 1.47 status or, if a nonsigning person under § 1.47 has subsequently joined in a prior application, then a copy of the subsequently executed declaration must be filed. See 37 C.F.R. §§ 1.63(d)(1)-(3).

**NOTE:** A declaration filed to complete an application must be executed, identify the specification to which it is directed, identify each inventor by full name including family name and at least one given name, without abbreviation together with any other given name or initial, and the residence, post office address and country or citizenship of each inventor, and state whether the inventor is a sole or joint inventor. 37 C.F.R. § 1.63(a)(1)-(4).

- ☐ Enclosed
- Executed by

(check all applicable boxes)

- ☐ inventor(s).
- ☐ legal representative of inventor(s).  
37 C.F.R. §§ 1.42 or 1.43.
- ☐ joint inventor or person showing a proprietary interest on behalf of inventor who refused to sign or cannot be reached.
  - ☐ This is the petition required by 37 C.F.R. § 1.47 and the statement required by 37 C.F.R. § 1.47 is also attached. See item 13 below for fee.

- ☒ Not Enclosed.

**NOTE:** Where the filing is a completion in the U.S. of an International Application or where the completion of the U.S. application contains subject matter in addition to the International Application, the application may be treated as a continuation or continuation-in-part, as the case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION CLAIMED.

- ☒ Application is made by a person authorized under 37 C.F.R. § 1.41(c) on behalf of all the above named inventor(s).

(The declaration or oath, along with the surcharge required by 37 C.F.R. § 1.16(e) can be filed subsequently).

- ☐ Showing that the filing is authorized.  
(not required unless called into question. 37 C.F.R. § 1.41(d))

## 6. Inventorship Statement

**WARNING:** If the named inventors are each not the inventors of all the claims an explanation, including the ownership of the various claims at the time the last claimed invention was made, should be submitted.

The inventorship for all the claims in this application are:

☐ The same.

or

☐ Not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made,

☐ is submitted.

☐ will be submitted.

## 7. Language

**NOTE:** An application including a signed oath or declaration may be filed in a language other than English. An English translation of the non-English language application and the processing fee of \$130.00 required by 37 C.F.R. § 1.17(d) is required to be filed with the application, or within such time as may be set by the Office. 37 C.F.R. § 1.52(d).

☒ English

☐ Non-English

☐ The attached translation includes a statement that the translation is accurate. 37 C.F.R. § 1.52(d).

## 8. Assignment

☒ An assignment of the invention to Nokia Mobile Phones Ltd.

☐ is attached. A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

☒ will follow.

**NOTE:** "If an assignment is submitted with a new application, send two separate letters—one for the application and one for the assignment." Notice of May 4, 1990 (1114 O.G. 77-78).

**WARNING:** A newly executed "CERTIFICATE UNDER 37 C.F.R. § 3.73(b)" must be filed when a continuation-in-part application is filed by an assignee. Notice of April 30, 1993, 1150 O.G. 62-64.

(New Application Transmittal [4-1]—page 5 of 11)

**9. Certified Copy**

Certified copy(les) of application(s)

Country Finland	Appin. No. 990640	Filed 22 March 1999
Country	Appin. No.	Filed
Country	Appin. No.	Filed

from which priority is claimed

☐ Is (are) attached.☒ Will follow.

NOTE: The foreign application forming the basis for the claim for priority must be referred to in the oath or declaration. 37 C.F.R. § 1.55(a) and 1.63.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. § 120 is itself entitled to priority from a prior foreign application, then complete item 18 on the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

**10. Fee Calculation (37 C.F.R. § 1.16)**A. ☒ Regular application

CLAIMS AS FILED						
Number filed	Number Extra		Rate	Basic Fee 37 C.F.R. § 1.16(a) \$ 690.00		
Total Claims (37 C.F.R. § 1.16(c))	11	- 20 =	0	×	\$ 18.00	0
Independent Claims (37 C.F.R. § 1.16(b))	3	- 3 =	0	×	\$ 78.00	0
Multiple dependent claim(s), If any (37 C.F.R. § 1.16(d))				+	\$260.00	

- ☐ Amendment cancelling extra claims is enclosed.
- ☐ Amendment deleting multiple-dependencies is enclosed.
- ☐ Fee for extra claims is not being paid at this time.

NOTE: If the fees for extra claims are not paid on filing they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office. In any notice of fee deficiency. 37 C.F.R. § 1.16(d).

Filing Fee Calculation

\$ 690.00

B. ☐ Design application  
(\$310.00—37 C.F.R. § 1.16(f))

Filing Fee Calculation

\$

C. ☐ Plant application  
(\$480.00—37 C.F.R. § 1.16(g))

Filing fee calculation

\$

11. Small Entity Statement(s)

- ☐ Statement(s) that this is a filing by a small entity under 37 C.F.R. § 1.9 and 1.27 is (are) attached.

**WARNING:** "Status as a small entity must be specifically established in each application or patent in which the status is available and desired. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. The refiling of an application under § 1.53 as a continuation, division, or continuation-in-part (including a continued prosecution application under § 1.53(d)), or the filing of a reissue application requires a new determination as to continued entitlement to small entity status for the continuing or reissue application. A nonprovisional application claiming benefit under 35 U.S.C. § 119(e), 120, 121, or 365(c) of a prior application, or a reissue application may rely on a statement filed in the prior application or in the patent if the nonprovisional application or the reissue application includes a reference to the statement in the prior application or in the patent or includes a copy of the statement in the prior application or in the patent and status as a small entity is still proper and desired. The payment of the small entity basic statutory filing fee will be treated as such a reference for purposes of this section." 37 C.F.R. § 1.28(a)(2).

**WARNING:** "Small entity status must not be established when the person or persons signing the . . . statement can unequivocally make the required self-certification." M.P.E.P., § 509.03, 6th ed., rev. 2, July 1996 (emphasis added).

(complete the following, if applicable)

- ☐ Status as a small entity was claimed in prior application  
\_\_\_\_\_ / \_\_\_\_\_, filed on \_\_\_\_\_, from which benefit  
is being claimed for this application under:

35 U.S.C. § ☐ 119(e),  
☐ 120,  
☐ 121,  
☐ 365(c),

and which status as a small entity is still proper and desired.

- ☐ A copy of the statement in the prior application is included.

Filing Fee Calculation (50% of A, B or C above)

\$ \_\_\_\_\_

**NOTE:** Any excess of the full fee paid will be refunded if small entity status is established and a refund request are filed within 2 months of the date of timely payment of a full fee. The two-month period is not extendable under § 1.136, 37 C.F.R. § 1.28(a).

12. Request for International-Type Search (37 C.F.R. § 1.104(d))

(complete, if applicable)

- ☐ Please prepare an international-type search report for this application at the time when national examination on the merits takes place."

13. Fee Payment Being Made at This Time

☐ Not Enclosed

☐ No filing fee is to be paid at this time.

(This and the surcharge required by 37 C.F.R. § 1.16(e) can be paid subsequently.)

☒ Enclosed

☒ Filing fee

\$ 690.00

☐ Recording assignment

(\$40.00; 37 C.F.R. § 1.21(h))

(See attached "COVER SHEET FOR  
ASSIGNMENT ACCOMPANYING NEW  
APPLICATION".)

\$ \_\_\_\_\_

☐ Petition fee for filing by other than all the  
inventors or person on behalf of the inventor  
where inventor refused to sign or cannot be  
reached

(\$130.00; 37 C.F.R. §§ 1.47 and 1.17(l))

\$ \_\_\_\_\_

☐ For processing an application with a  
specification in

a non-English language

(\$130.00; 37 C.F.R. §§ 1.52(d) and 1.17(k))

\$ \_\_\_\_\_

☐ Processing and retention fee

(\$130.00; 37 C.F.R. §§ 1.53(d) and 1.21(l))

\$ \_\_\_\_\_

☐ Fee for international-type search report

(\$40.00; 37 C.F.R. § 1.21(e))

\$ \_\_\_\_\_

NOTE: 37 C.F.R. § 1.21(f) establishes a fee for processing and retaining any application that is abandoned for failing to complete the application pursuant to 37 C.F.R. § 1.53(f) and this, as well as the changes to 37 C.F.R. §§ 1.53 and 1.78(a)(1), indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid, or the processing and retention fee of § 1.21(f) must be paid, within 1 year from notification under § 53(f).

Total fees enclosed

\$ 690.00

14. Method of Payment of Fees

☒ Check in the amount of \$ 690.00

☐ Charge Account No. \_\_\_\_\_ in the amount of  
\$ \_\_\_\_\_

A duplicate of this transmittal is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 C.F.R. § 1.22(b).



# **15. Authorization to Charge Additional Fees**

**WARNING:** If no fees are to be paid on filing, the following items should not be completed.

**WARNING:** Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

- ☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 16-1350:

☒ 37 C.F.R. § 1.16(a), (f) or (g) (filing fees)

☒ 37 C.F.R. § 1.16(b), (c) and (d) (presentation of extra claims)

**NOTE:** Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.16(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.

☒ 37 C.F.R. § 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☒ 37 C.F.R. § 1.17(a)(1)-(5) (extension fees pursuant to § 1.136(a)).

☐ 37 C.F.R. § 1.17 (application processing fees)

**NOTE:** "... A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).

☐ 37 C.F.R. § 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. § 1.311(b))

**NOTE:** Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).

**NOTE:** 37 C.F.R. § 1.28(b) requires "Notification of any change in status resulting in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying, . . . the issue fee. . . ." From the wording of 37 C.F.R. § 1.28(b), (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

(New Application Transmittal [4-1]—page 9 of 11)

**16. Instructions as to Overpayment**

NOTE: "... Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

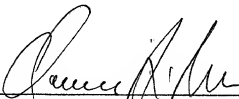
- ☒ Credit Account No. 16-1350  
☐ Refund

SEND ALL CORRESPONDENCE TO:

Reg. No. 24,622

Tel. No. (203) 259-1800

Customer No.

  
SIGNATURE OF PRACTITIONER  
Clarence A. Green  
(type or print name of attorney)  
PERMAN & GREEN, LLP  
P.O. Address  
425 Post Road, Fairfield, Connecticut 06430

☐ **Incorporation by reference of added pages**

*(check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED)*

- ☐ Plus Added Pages for New Application Transmittal Where Benefit of Prior U.S. Application(s) Claimed

Number of pages added \_\_\_\_\_

- ☐ Plus Added Pages for Papers Referred to in Item 4 Above

Number of pages added \_\_\_\_\_

- ☐ Plus added pages deleting names of inventor(s) named in prior application(s) who is/are no longer inventor(s) of the subject matter claimed in this application.

Number of pages added \_\_\_\_\_

- ☐ Plus "Assignment Cover Letter Accompanying New Application"

Number of pages added \_\_\_\_\_

☒ **Statement Where No Further Pages Added**

*(if no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item)*

- ☒ This transmittal ends with this page.

**TITLE:** Method and arrangement for preparing for the transmission of multimedia-related information in a packet-switched cellular radio network

5    **TECHNOLOGICAL FIELD**

The invention concerns generally the use of certain protocols and services for conveying certain types of information between the different nodes of a telecommunication network. Especially the invention concerns the preparations for  
10    and execution of the transmission of multimedia-related information between a terminal of a cellular radio network and a node computer of a fixed packet-switched network.

15    **BACKGROUND OF THE INVENTION**

Multimedia is generally understood as the synchronized presentation of audiovisual objects to a user. It is typical to multimedia-related information that it may contain elements of highly different nature, like text, still images, simple graphical elements,  
20    video and sound.

MMS or Multimedia Messaging Service is a proposed way for arranging the delivery of messages containing multimedia-related information from one telecommunication device to another. With "multimedia-related" information we  
25    mean both the actual payload data that represents presentable objects and the control information that tells a presentation device how to handle the payload data. According to the proposals, MMS should be applicable for conveying such messages to and from the terminals of packet-switched cellular radio networks such as GPRS (General Packet Radio Service) and the packet-switched parts of UMTS  
30    (Universal Mobile Telecommunication System) in a store-and-forward manner much like the SMS (Short Messaging Service) text messages are conveyed in the second generation digital cellular networks, e.g. GSM (Global System for Mobile telecommunications).

35    Fig. 1 illustrates some system aspects of a known proposal for arranging the transmission of MMS messages between two mobile terminals (or generally: terminal arrangements) 101 and 102. In Fig. 1 each terminal is operating in a cellular telephone system of its own: terminal 101 is a UMTS terminal operating in

a UMTS network 103 and terminal 102 is an enhanced GSM terminal operating in an enhanced GSM network 104. From both networks there is a connection to a GPRS network 105. The UMTS network 103 comprises a UTRAN or UMTS Terrestrial Radio Access Network 106 as well as a CN or Core Network 107. In the enhanced GSM network 104 a BSS or Base Station Subsystem 108 and an MSC or a Mobile Switching Centre 109 are shown. The detailed structure of the network elements is unessential to the present invention, but it is known that for example a UTRAN consists of a number of Radio Network Subsystems, each of which in turn comprises a Radio Network Controller and a number of Node Bs roughly corresponding to base stations. A BSS in turn comprises a Base Station Controller and a number of Base Transceiver Stations operating under it. Various mixed-mode cellular telephone systems are possible; for example the BSS 108 might operate under the same CN as the UTRAN 106. The terminals could also be exactly similar terminals operating close to each other in a single cell.

In Fig. 1 there is a connection both from the UTRAN 106 and from the BSS 108 to a corresponding SGSN or Serving GPRS Support Node 110 and 111. Both of these are in turn coupled, through the GPRS trunk lines, to a GGSN or Gateway GPRS Support Node 112 which here also operates as an MMSC or a Multimedia Messaging Service Center. In analogy with the known SMS arrangements a terminal 101 may transmit an MMS message by identifying both the intended recipient's terminal 102 and the MMSC through which the message is to be transmitted (actually the latter may even be left out if there is a default MMSC for each terminal). A Packet Control Unit or a corresponding functionality in the UTRAN 106 takes the MMS transmission and routes it through the current SGSN 110 to the MMSC 112 which stores the MMS message and commences the attempts for delivering it to the intended recipient. If there is an existing connection to the recipient's terminal 102 the MMSC may deliver the message through the corresponding SGSN 111 and the BSS 108 to the terminal 102. If, however, the terminal 102 is temporarily shut off, out of coverage or otherwise unreachable, the MMSC retries the delivery at certain time intervals until either the message is successfully delivered or a timeout expires indicating that the message is obsolete and can be deleted undelivered. A positive or negative acknowledgement, depending on the success in delivery, may be returned through the MMSC to the transmitting terminal 101 if required.

At the time of filing this patent application there does not exist an unambiguously defined way of using the lower-level protocol layers and PDP Contexts (Packet

Data Protocol) in the terminals and fixed network devices to convey the MMS messages. Somewhere at a relatively high level in the protocol stacks of both the terminals and the MMSC there must be an MMS-TP (Multimedia Messaging Service - Transport Protocol) entity that uses the services offered by the lower level protocols to convey an MMS message first from the transmitting device to the MMSC and then further to the receiving device. The actual name of the protocol entity may also be something else. Additionally the MMS messages must be mapped into PDP Contexts of certain type; the mapping will be closely related to the choice of lower protocol layers under the MMS-TP entity. We anticipate that network operators will require the MMS messaging to be distinguishable from other forms of packet-switched data transmission in order to arrange for a suitable charging scheme for the MMS services.

A prior art solution which has been proposed for conveying MMS messages is to have a PDP Type separately defined for MMS, and to set up a PDP Context of that type between a terminal and an MMSC each time an MMS message has to be conveyed in either direction. This approach has the drawback of requiring a considerable amount of completely new specification and standardization work. Additionally new PDP Types are only very reluctantly accepted to the already frozen standards.

## SUMMARY OF THE INVENTION

It is an object of the present invention to provide a feasible method and a corresponding arrangement for setting up and configuring a connection suited for conveying MMS messages between terminals and MMSCs. It is an additional object of the invention that the proposed method does not require exhaustive respecification in the framework of existing standards and proposals.

The objects of the invention are met by using the IP or Internet Protocol PDP Context type, known as such, to carry a data stream comprising the required multimedia-related information, and by configuring the IP address of a MMSC to a terminal dynamically, most advantageously as a part of the PDP Context activation process.

The method according to the invention is characterized in that it comprises the steps of

- defining a multimedia messaging transport protocol layer as a certain layer above the Internet Protocol layer in certain first and second protocol stacks so that the defined multimedia messaging transport protocol layers are peer entities and
- exchanging multimedia-related information between the multimedia messaging transport protocol layer in a terminal arrangement and the multimedia messaging transport protocol layer in a network device arrangement through the use of additionally defined Internet Protocol layers as well as other lower layers in the first and second protocol stacks.

- 10 The invention also applies to a terminal which is characterized in that its control block is arranged to
- implement a multimedia messaging transport protocol layer in a protocol stack and
  - exchange multimedia-related information between said multimedia messaging transport protocol layer in the protocol stack and a certain network device
- 15 arrangement through the use of an Internet Protocol layer as well as other lower layers in the protocol stack.

Additionally the invention applies to a network device which is characterized in that its control block is arranged to

- 20 - implement a multimedia messaging transport protocol layer in a protocol stack and
- exchange multimedia-related information between said multimedia messaging transport protocol layer in the protocol stack and a terminal arrangement through the use of an Internet Protocol layer as well as other lower layers in the protocol stack.

- 25 The Internet Protocol or IP is a well-known protocol for routing packet data through a data transmission network. The GPRS standards and proposals that are available to the public at the priority date of this patent application describe the activation and use of a specific PDP Context type for carrying IP packets. According to the invention a PDP Context of the IP type is activated also for the transmission of
- 30 multimedia-related information. On the basis of the contents of a request message the network devices (mainly the SGSN) are able to route a request for the activation of a PDP Context to an MMSC. As a part of the known PDP Context activation process such an MMSC transmits a response, and according to the invention it indicates its IP address (or the IP address of another, more suitable MMSC) within said response. Dynamic IP address allocation is most advantageously applied to
- 35 allocate an IP address to the terminal that initiated the PDP Context activation. The dynamically allocated IP address of the terminal is indicated to the MMSC, whereafter the IP addresses of the communicating parties are known to each other

and the activated PDP Context of the IP type may be used to transmit multimedia-related information.

- The invention has several advantageous features. The dynamic indication of the IP address of the MMSC at the PDP Context activation stage enables more flexible and optimal routing of MMS traffic in the cases where the terminal arrangement is roaming, because the terminal can connect also to other MMSCs than the 'home' MMSC. The invention also avoids static storage of MMSC addresses within the user's terminal or Subscriber Identity Module (SIM), because the MMSC address can be dynamically configured to the MS. The dynamic configuration of MMSC addresses also allows the operator to reconfigure the network and MMSCs to be used for message delivery. Some MMSCs can be e.g. run down in maintenance while other MMSCs take responsibility of the users. Controlled distribution of users and message load is also possible in the suggested solution. The network can dynamically distribute users among a certain group of processing units and/or MMSCs by just allocating different IP addresses for different users.

#### BRIEF DESCRIPTION OF THE DRAWINGS

- The novel features which are considered as characteristic of the invention are set forth in particular in the appended Claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings.

- Fig. 1 illustrates some known system aspects of packet-switched data transmission,
- Fig. 2 illustrates an arrangement of protocol stacks according to the invention,
- Fig. 3 is a schematic illustration of a method according to the invention,
- Fig. 4 is a schematic illustration of an Activate PDP Context Request used in association with the invention,
- Fig. 5 is a schematic illustration of an Activate PDP Context Response used in association with the invention,



Fig. 6 illustrates schematically an arrangement according to the invention and

Fig. 7 summarizes some aspects of certain protocol layers according to the invention.

Fig. 1 has been already discussed above within the description of prior art.

## 10 DETAILED DESCRIPTION OF THE INVENTION

Fig. 2 illustrates an advantageous arrangement of protocol stacks in a terminal or Mobile Station (MS), an Base Station Subsystem (BSS), a Serving GPRS Support Node (SGSN) and a Multimedia Messaging Service Center (MMSC). The notation  
 15 refers to the application of the invention in association with an enhanced GSM network; this should not be construed as an implicit limitation to the applicability of the invention. In the context of UMTS, for example, the terminal would be designated as the UE (User Equipment) and the BSS would be substituted by one of the network devices belonging to a UTRAN, e.g. a Node B or a Radio Network  
 20 Controller. Within the BSS or the UTRAN there may be a specific interface unit that takes care of all data traffic to and from such packet data networks that do not share the switching facilities (the core networks) with the cellular telephone systems.

25 The protocol layers related to the application of the invention in the MS are, from bottom to top, Layer 1 201, Medium Access Control 202, Radio Link Control 203, Logical Link Control 204, Subnetwork Dependent Convergence Protocol 205, Internet Protocol 206 and Multimedia Messaging Service - Transport Protocol 207. Some sources refer to some of these layers as sublayers, which has no practical  
 30 importance to the present invention. It has to be noted that the "MS" is a general notation for the apparatus or arrangement of apparatuses which are operative at a terminal end: one possible "MS" arrangement is a mobile telephone or other cellular network terminal coupled to a laptop computer, whereby for example the IP protocol layer 206 may reside in the mobile telephone and the MMS-TP protocol  
 35 layer 207 may reside in the laptop computer. The invention does not require the MMS-TP protocol layer 207 to be immediately on top of the Internet Protocol layer 206; one or several other layers like UDP (User Datagram Protocol), TCP (Transport Control Protocol) or others might come therebetween.

On the left-hand side of the BSS the three lowest layers 211, 212 and 213 are the same and on top of them there is LLC Relay layer 214 for performing the required conversions between the left-hand and right-hand sides of the BSS. The three right-hand layers of the BSS are, from bottom to top, Layer 1 221, Frame Relay layer 222 and BSS GPRS Protocol layer 223. In the SGSN the three lowest left-hand side layers 231, 232 and 233 are same as on the right-hand side of the BSS, and above them is the Logical Link Control layer 234 which is the peer entity of the similarly named layer in the MS. On the right-hand side of the SGSN there are the Layer 1 241, Layer 2 242 and Internet Protocol 243 layers. On top of the SGSN protocol stack there is a conversion entity consisting of an SNDCP half 235 and a GPRS Tunneling Protocol half 244. The protocol layers of the MMSC are, from bottom to top, Layer 1 251, Layer 2 252, first Internet Protocol layer 253, GPRS Tunneling Protocol 254, second Internet Protocol layer 255 and Multimedia Messaging Service - Transport Protocol 256. Again the invention allows the second Internet Protocol layer 255 and Multimedia Messaging Service - Transport Protocol layer 256 to be separated by one or more other protocol layers therebetween.

Also at the GGSN/MMSC end there may be a division of the protocol layers to those implemented within an actual GGSN (e.g. layers 251 to 255) and those implemented within a separate MMSC entity (e.g. layer 256).

The use of the above-mentioned protocol layers in context of the present invention is explained in more detail in the following, with reference also to Figs. 3, 4 and 5. As an example we will use a mobile-originated procedure for enabling the exchange of MMS messages between a MS and a MMSC. At step 301 the MS transmits an Activate PDP Context Request message in a way basically known as such. In order to use said message to set up a PDP Context suitable for MMS transmission using the IP, the MS needs to incorporate a certain set of parameters in the message. These parameters are schematically illustrated in Fig. 4 and they have the following meaning:

\* The Network Service Access Point Identifier or NSAPI 401 is selected by the MS. NSAPI identifies the PDP context to be activated within the GPRS/UMTS network. For identifying the user the message comprises also the TLLI (Temporary Logical Link Identity) and IMSI (International Mobile Subscriber Identity) information elements (not shown in Fig. 4).

\* The PDP Type 402 shall have the known specified value that indicates that a PDP Context of the IP type should be activated.

\* The PDP Address field 403 is most advantageously empty, meaning that the GGSN or combined GGSN/MMSC that will receive the request message must allocate a dynamic IP address for the MS.

\* The Access Point Name or APN 404 is selected by the MS. For the purposes of the invention, there should be a commonly accepted value for the APN field that corresponds to the meaning "this request message is meant for an MMSC, the address of which is unknown to the sender of the message". We may generally designate the corresponding value as selecting "MMSC" as the APN. It indicates to a SGSN that it should forward the request to an MMSC or to a GGSN coupled to an MMSC. In the latter case (where the MMSC functionality is separated from the GGSN) the GGSN knows – based on the APN value – that the requested PDP Context is for MMS and is able to handle the MMS context activation appropriately.

\* The QoS Requested 405 (where QoS comes from Quality of Service) is selected by the MS. The requested service quality comprises a number of factors and their selection typically depends on the desired characteristics of the MMS-TP. Of the known reliability classes, class 2 is seen as the most advantageous, meaning RLC&LLC retransmissions as well as the use of UDP (User Datagram Protocol) at the GPRS backbone network. Bit rates can be negotiated to be anything without the invention limiting their negotiation. MMS message transmission is in general time-insensitive, so delay class should reflect that; long delays are allowed. Service precedence is most advantageously high if it indicates dropping precedence which results in few packet losses.

\* The PDP Configuration Options field 406 can be used e.g. for informing the MMSC about certain capabilities of the MS, such as supported content-types etc. MS-MMSC configuration information can be included in this information element if these are not implemented into the MMS-TP protocol itself. If there are many choices for the MMS-TP protocol (either totally separate protocols or different versions of the same protocol), the PDP Configuration Options can be used for informing the MMSC which protocol(s) the MS supports on top of IP.

At step 302 the BSS recognizes the Activate PDP Context Request message as concerning packet-switched services and consequently routes it to the current SGSN in a known way. At step 303 the SGSN validates the request in a known way and sends a corresponding Create PDP Context Request to a combined GGSN/MMSC or to a GGSN coupled to a MMSC. The known fields in the Create PDP Context Request message are the PDP Type, PDP Address, Access Point Name, QoS

Negotiated, TID (Tunnel Identifier), Selection Mode and PDP Configuration Options fields. Of these the ones that are closely related to the present invention are PDP Type (= "IP"), PDP Address (empty), Access Point Name (as set by the MS) and PDP Configuration (if it contains e.g. the MMS configuration information referred to above).

At step 304 the GGSN/MMSC receives the request message and at step 305 it replies with the Create PDP Context Response message the general form of which is known as such. Fig. 5 illustrates schematically a response message with the following fields:

- \* The contents of the Tunnel Identifier or TID field 501 are the same which the SGSN used in its Create PDP Context Request to identify the PDP Context which is about to be activated.
- \* The PDP Address field 502 contains a dynamically allocated IP address for the MS; the dynamic allocation of IP addresses is known as such and is a consequence of the fact that the MS left the corresponding field empty in its Activate PDP Context Request.
- \* The BB Protocol, Reordering Required, QoS Negotiated and Cause fields 503, 504, 505 and 506 are used according to the existing GPRS specifications.
- \* According to the invention, the GGSN/MMSC incorporates into this message also its own IP address(es). The most advantageous way is to use the PDP Configuration Options field 507 in the response message to convey the IP-address(es) of the MMSC. Also, if TCP or UDP is to be transparently used on top of UMTS/GPRS bearer, the PDP Configuration Options for MMS protocol may include port number(s) to be used for the communication. This way the MMSC makes itself reachable by a conventional IP packet delivery (TCP or UDP).

The SGSN receives the Create PDP Context Response message and sends the corresponding Activate PDP Context Accept message through the BSS to the MS at step 306; the reception of this message at the MS is designated as 307. The known fields of the last mentioned are the PDP Type, PDP Address, NSAPI, QoS Negotiated, Radio Priority Level and PDP Configuration Options fields. The PDP Configuration Options in this message are exactly the same as set by the MMSC (or the GGSN) in the PDP Context Response message. The IP-address(es) of the MMSC (stored in the PDP Configuration Options parameter) is/are passed to the MMS-layer of the MS. Hence, the MS knows which IP-address to use in the continuation as the destination for MMS messages.

In an advantageous implementation the GGSN part of the GGSN/MMSC functionality is configured to return the MMSC's IP address(es) and possibly also port number(s) without interacting with the MMSC itself. Once the PDP Context for MMS has been established and the GGSN has allocated a dynamic IP address to the user (as usually in the case of known dynamic address allocation of GPRS), the mobile station can start connection establishment or message transmission with the MMSC according to block 308 in Fig. 3. This might require that the MS informs the MMSC (as defined in MS-MMSC protocol) that it is reachable through a particular IP address.

There are several different approaches how to provide service to an MS also if the serving MMSC resides at a visited network:

- \* If the MMSC connected by the MS resides in the visited network, it might be necessary to inform an MMSC at the home network about the user's current location (i.e. the serving MMSC at the visited network). This notification may be carried out as part of a specific MMSC-MMSC protocol, or the visited MMSC may update the user's Home Location Register or HLR on the serving MMSC address. The latter approach requires addition of two new procedures between the MMSC and HLR; Update MMS Location and Send Routing Info for MMS. The former is used to update serving MMSC information in HLR, while the latter is used by the home network MMSC to request for the IP address of the MMSC currently serving the user (for it to be able to forward the message to the visited network). New HLR parameter, Serving MMSC Address, should be added to HLR records.
  - \* Alternative solution between MMSCs: Mobile IP (or Ipv6; Internet Protocol version 6) could be employed between MMSCs so that the home MMSC takes the place of a "home agent" and the visited MMSC takes the place of a foreign agent. The home MMSC address may be given by the user/MS or it may be included in the HLR.
  - \* The home MMSC could always be used as the one to deliver an MMS message to its intended recipient. This would probably require the MS to have a fixed IP address, but it would enable the home MMSC to find out immediately if the delivery was unsuccessful.
- The activation of the PDP Context for transmitting MMS messages may also take place upon the initiative of the MMSC, for example in such a case where an MMS message has been stored for delivery to an MS which currently does not have an active PDP Context with the MMSC. According to the adopted practice within

GPRS, the MS is always the one to transmit the initial Activate PDP Context Request message, but it is possible for the MMSC to indicate to the MS through a simple signalling message that there is a stored MMS message waiting for delivery, so that it is left to the MS's discretion to choose the moment for activating the PDP Context by commencing the procedures illustrated in Fig. 3.

There may also be a kind of alerting arrangement where the indication about undelivered MMS messages is transmitted from the MMSC to some other network device which in turn then forwards the information to the MS. Another alerting arrangement could be such where the MMSC is informed when a MS which previously was not reached becomes reachable.

In other network arrangements than GPRS an MMSC-originating PDP Context activation (though probably with different designations of the participating devices and associated messages) could be nearly identical to the MS-originating one described above, with the exception that the initial activation message and the response thereto would travel into opposite directions than above. The identification information in the former would then serve to identify a particular MS instead of a SGSN-GGSN/MMSC combination, whereby the routing of the message could involve the known inquiries to the location registers which store the current location information of the MS. The IP address(es) of the MMSC as well as the dynamically allocated IP address for the MS can then be incorporated into the activation request message transmitted by the MMSC.

Fig. 6 illustrates an arrangement according to the invention comprising a terminal or MS (or UE) 601, a BSS or UTRAN 602, a SGSN 603 and a combined GGSN/MMSC 604. The hardware of the terminal comprises a radio transceiver block 612, a decoding/demultiplexing block 613, an encoding/multiplexing block 614, a control block 615 and a user data part 616. The decoding/demultiplexing block 613 is arranged to separate received signalling information from received user data and to direct the former into the control block 615; similarly the encoding/multiplexing block 614 is arranged to take signalling information from the control block 615 and to multiplex it for transmission with user data coming from the user data part 616. All other blocks operate under the supervision of the control block. The control connections are shown with thinner lines than the user data and signalling information connections. The MS protocol stack seen in greater detail in Fig. 2 is implemented within the control block 615 by programming the corresponding operations into a memory in the form of machine-readable processing

instructions. If the terminal arrangement comprises a number of separate functional entities, the control block may be understood to consist of the control functions distributed into the physical controlling entities of the separate devices.

- 5 The MMSC is basically a large-capacity data storage 621 with a transmission unit 622 arranged to couple it to the trunk lines of the GPRS network (or a corresponding packet data network) as well as a control unit 623 to control the setting up, maintaining and tearing down of connections. The MMSC protocol stack seen in greater detail in Fig. 2 is implemented within the control block 623 by
- 10 programming the corresponding operations into a memory in the form of machine-readable processing instructions. For implementing the dynamic IP address allocation the GGSN/MMSC entity comprises also a dynamic address allocation unit 624 which is known as such; for the purposes of the invention the dynamic address allocation unit 624 may also be arranged to insert into suitable Create PDP
- 15 Context Response messages the IP address(es) of the MMSC so that interaction between the GGSN functionality and the MMSC functionality is not required at the PDP Context activation stage.

- Fig. 7 summarizes the functions of the MMS-TP, IP and lower protocol layers in a
- 20 MS. The MMS-TP protocol layer 701 is arranged to indicate to the IP layer 702 the need for setting up a PDP Context of the IP type with a first primitive 703; this primitive should contain at least the APN, QoS Requested and PDP Configuration Options information elements referred to above. The IP layer 702 is in general capable of indicating to the lower layers the need for setting up PDP Contexts, and
- 25 especially capable of indicating with a setup request primitive 704 that a PDP Context of the IP type should be requested. This second primitive 704 should contain at least the PDP Type, APN, QoS Requested and PDP Configuration Options information elements referred to above. The lower layers are in general capable of informing the IP layer 702 about the completed activation of the PDP
- 30 Context with a third primitive 705, and the IP layer 702 is in turn capable of forwarding the same information to the MMS-TP layer 701 in a fourth primitive 706.

- Setting up the PDP Context could also involve separate control protocol entities. In
- 35 any case, during operation the MMS-TP layer 701 is arranged to exchange user data with the IP layer according to the arrow 707, and the IP layer is arranged to transmit the user data to be transmitted further down in the protocol stack according to arrow 708.

Supposing that the activation of the IP type PDP contexts for MMS use always takes place upon the initiative of the MS, the existence of primitives 703 and 704 would not be required at the GGSN/MMSC end. In any case it must be noted that the IP layer 702 of Fig. 7 corresponds to the second or upper IP layer in the GGSN/MMSC protocol stack. Tearing down the IP type PDP Context follows the known procedures of tearing down PDP Contexts.



# CLAIMS

1. ~~A~~ method for setting up an active connection for transmitting multimedia-related information between a terminal arrangement and a network device arrangement coupled to a packet-switched data transmission network, comprising the steps of:
  - 5 - defining a first protocol stack for the terminal arrangement and a second protocol stack for the network device arrangement, the protocol stacks consisting of layers, for arranging the mutual exchange of information between the terminal arrangement and the network device arrangement,
  - 10 - defining an Internet Protocol layer for the transmission of packetized data as a certain layer in the first protocol stack and a certain layer in the second protocol stack so that the defined Internet Protocol layers are peer entities,
  - defining a multimedia messaging transport protocol layer as a certain layer above the Internet Protocol layer in the first and second protocol stacks so that the defined
  - 15 multimedia messaging transport protocol layers are peer entities and
  - exchanging multimedia-related information between the multimedia messaging transport protocol layer in the terminal arrangement and the multimedia messaging transport protocol layer in the network device arrangement through the use of the defined Internet Protocol layers as well as other lower layers in the first and second
  - 20 protocol stacks.
2. A method according to claim 1, comprising the steps of:
  - conveying a request for activating the exchange of multimedia-related information from the terminal arrangement to the network device arrangement and
  - 25 - as a response to said request, conveying from the network device arrangement to the terminal arrangement a response comprising an address for identifying the network device arrangement to the terminal arrangement on the Internet Protocol level.
- 30 3. A method according to claim 2, wherein said step of conveying a request for activating the exchange of multimedia-related information comprises the substeps of:
  - conveying a primary request from the terminal arrangement to a routing device, said primary request comprising, as a substitute to an exact recipient address, a
  - 35 general indication that said primary request is related to the activation of the exchange of multimedia-related information and
  - on the basis of said general indication, conveying from said routing device to the network device arrangement a secondary request.

4. A method according to claim 3, wherein said primary request is an Activate PDP Context Request message comprising:
  - a Network Service Access Point Identifier for identifying the PDP context to be activated,
  - a PDP Type value for identifying the protocol as Internet Protocol,
  - a dummy Access Point Name for indicating that said Activate PDP Context Request is related to the activation of the exchange of multimedia-related information,
  - a QoS Requested field for indicating the requested quality of service for the PDP context to be activated and
  - a PDP Configuration Options field for carrying other information related to the PDP context to be activated;
 and said secondary request is a Create PDP Context Request message.
5. A method according to claim 2, wherein said step of conveying a response comprises the substeps of:
  - conveying a primary response from the network device arrangement to a routing device, said primary response comprising an address for identifying the network device arrangement to the terminal arrangement on the Internet Protocol level and
  - conveying from said routing device to the terminal arrangement a secondary response comprising said address.
6. A method according to claim 5, wherein said primary response is a Create PDP Context Response message comprising a PDP Configuration Options field to convey said address, and said secondary response is a Activate PDP Context Accept message.
7. A method according to claim 1, comprising the step of dynamically allocating an address to the terminal arrangement for identifying the terminal arrangement to the network device arrangement on the Internet Protocol level.
8. A terminal arrangement for exchanging multimedia-related information with a network device arrangement through a packet-switched data transmission network, comprising:
  - a radio transceiver block,
  - a control entity,
  - a user data part

- a decoding/demultiplexing block arranged to separate received signalling information from received user data and to direct the former into the control entity and

- 5 - an encoding/multiplexing block arranged to take signalling information from the control entity and to multiplex it for transmission with user data coming from the user data part;

wherein the control entity is arranged to:

- 10 - implement a protocol stack and an Internet Protocol layer for the transmission of packetized data as a certain layer in the protocol stack, for arranging the mutual exchange of information between the terminal arrangement and the network device arrangement,
- implement a multimedia messaging transport protocol layer in the protocol stack and
- 15 - exchange multimedia-related information between said multimedia messaging transport protocol layer in the protocol stack and the network device arrangement through the use of the Internet Protocol layer as well as other lower layers in the protocol stack.

9. A terminal arrangement according to claim 8, comprising a communication device and a presentation device coupled to said communication device, whereby the control entity consists of parts distributed into said communication device and said presentation device, so that said Internet Protocol layer is implemented in said communication device and said multimedia messaging transport protocol layer is implemented in said presentation device.

- 25 ~~10.~~ A network device arrangement for exchanging multimedia-related information with a terminal arrangement through a packet-switched data transmission network, comprising:

- a transmission unit,
- 30 - a control entity and
- a data storage;

wherein the control entity is arranged to

- implement a protocol stack and an Internet Protocol layer for the transmission of packetized data as a certain layer in the protocol stack for arranging the mutual
- 35 exchange of information between the network device arrangement and the terminal arrangement,
- implement a multimedia messaging transport protocol layer in the protocol stack and

- exchange multimedia-related information between said multimedia messaging transport protocol layer in the protocol stack and the terminal arrangement through the use of the Internet Protocol layer as well as other lower layers in the protocol stack.

5

11. A network device arrangement according to claim 10, comprising a node device of the packet-switched data transmission network and a multimedia messaging device coupled to said node device, whereby the control entity consists of parts distributed into said node device and said multimedia messaging device, so
- 10 that said Internet Protocol layer is implemented in said node device and said multimedia messaging transport protocol layer is implemented in said multimedia messaging device.

## ABSTRACT

A method is provided for transmitting multimedia-related information between a first device and a second device coupled to a packet-switched data transmission network. A first protocol stack (201, 202, 203, 204, 205, 206, 207) is defined for the first device and a second protocol stack (251, 252, 253, 254, 255, 256) is defined for the second device. The protocol stacks consist of layers and serve the arranging of the mutual exchange of information between the first device and the second device. An Internet Protocol layer (206, 255) is defined for the transmission of packetized data as a certain layer in the first protocol stack and a certain layer in the second protocol stack. A multimedia messaging transport protocol layer (207, 256) is also defined as a certain layer above the Internet Protocol layer (206, 255) in the first and second protocol stacks. Multimedia-related information is exchanged between the multimedia messaging transport protocol layer (207) in the first device and the multimedia messaging transport protocol layer (256) in the second device through the use of the Internet Protocol layer (206, 255) as well as other lower layers in the first and second protocol stacks.

Fig. 2

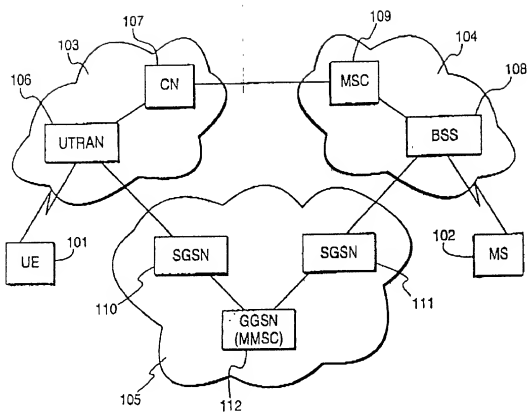


Fig. 1  
PRIOR ART

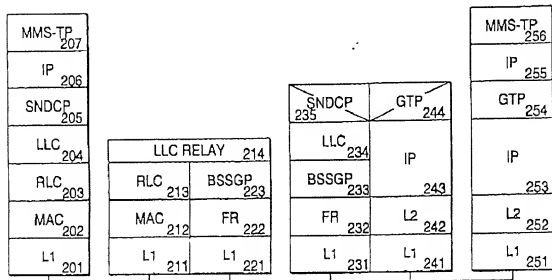


Fig. 2

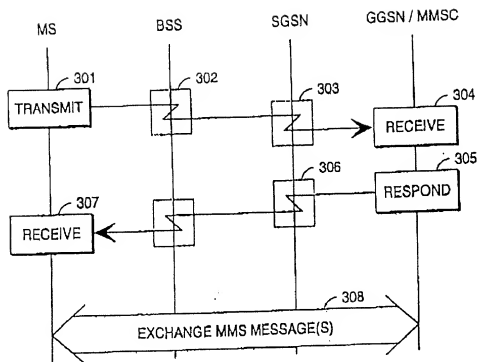


Fig. 3

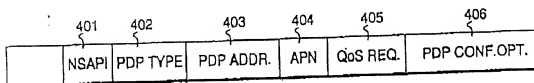


Fig. 4

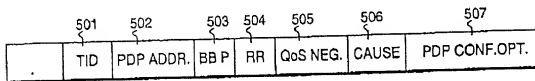


Fig. 5

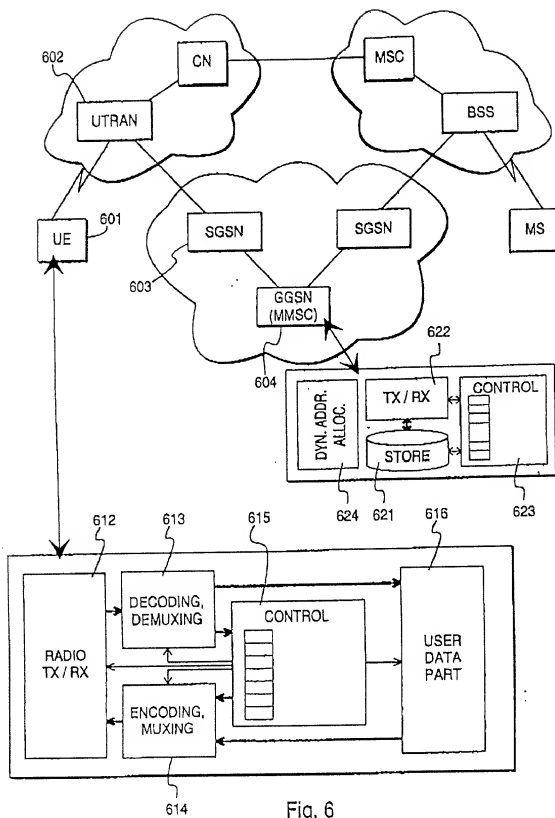


Fig. 6



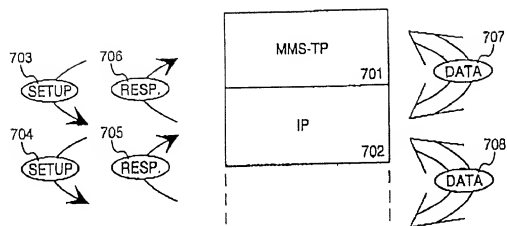


Fig. 7